QUICK REFERENCE

NI-DMM™ Instrument Driver

Initialize and Close

ICON	TYPE	PARAMETER	VALUE TO SET, COMMENTS[1]
	**niDMM Initialize**[2]		
	`(niDMM_init)`		
	Creates a new session to the instrument.		
	ViRsrc	resourceName	For Traditional NI-DAQ devices, use `DAQ::#`, where # is the device number. For NI-DAQmx devices, the device name is assigned by Measurement & Automation Explorer (MAX). Optionally, for all devices you can use an IVI logical name.
	ViBoolean	IDQuery	`NIDMM_VAL_TRUE` `NIDMM_VAL_FALSE`
	ViBoolean	resetDevice	`NIDMM_VAL_TRUE` `NIDMM_VAL_FALSE`
	ViSession*	vi	Reference to new session handle
	**niDMM Initialize with Options**		
	`(niDMM_InitWithOptions)`		
	Creates a new session to the instrument and optionally sets the initial state of session properties.		
	ViRsrc	resourceName	For Traditional NI-DAQ devices, use `DAQ::#`, where # is the device number. For NI-DAQmx devices, the device name is assigned by Measurement & Automation Explorer (MAX). Optionally, for all devices you can use an IVI logical name.
	ViBoolean	IDQuery	`NIDMM_VAL_TRUE` `NIDMM_VAL_FALSE`
	ViBoolean	resetDevice	`NIDMM_VAL_TRUE` `NIDMM_VAL_FALSE`
	ViString	Option String	Simulate = 0, RangeCheck = 1 QueryInstrStatus = 1, Cache = 1
	ViSession*	vi	Reference to new session handle

1 In LabWindows™/CVI™, C, and C++, constant names such as NIDMM_VAL_TRUE and NIDMM_VAL_AUTO_ZERO_ON refer to the use of #defines in your program. In LabVIEW, these constants refer to Boolean or ring controls with corresponding entries. For example, NIDMM_VAL_AUTO_ZERO_ON corresponds to the LabVIEW ring control entry Auto Zero On. Refer to LabVIEW Help (Show Help) for more details.

2 Function name for LabWindows/CVI, C, C++, and Visual Basic.

NATIONAL INSTRUMENTS™

Initialize and Close (continued)

ICON	TYPE	PARAMETER	VALUE TO SET, COMMENTS
	**niDMM Close**		
	`(niDMM_close)`		
	Closes the current session to the instrument.		
	ViSession	vi	Session handle

Configure

ICON	TYPE	PARAMETER	VALUE TO SET, COMMENTS
	**niDMM Configure Measurement Digits**		
	`(niDMM_ConfigureMeasurementDigits)`		
	Configures the common properties of the measurement.		
	ViSession	vi	Session handle
	ViInt32	Function	DC volts, AC volts, and so on
	ViReal64	Range	
	ViReal64	Resolution in Digits	
	**niDMM Configure Multi Point**		
	`(niDMM_ConfigureMultiPoint)`		
	Configures the properties for multipoint measurements.		
	ViSession	vi	Session handle
	ViInt32	Trigger Count	Default = 1
	ViInt32	Sample Count	Default = 1
	ViInt32	Sample Trigger	Immediate, External, TTL0, and so on
	ViReal64	Sample Interval	Default = Auto
	**niDMM Configure Waveform Acquisition**		
	`(niDMM_ConfigureWaveformAcquisition)`		
	Configures the NI 4070/4071/4072 for waveform acquisitions.		
	ViSession	vi	Session handle
	ViInt32	Function	Voltage Waveform, Current Waveform
	ViReal64	Range	
	ViReal64	Rate	
	ViInt32	WaveformPoints	

Measurement Options

ICON	TYPE	PARAMETER	VALUE TO SET, COMMENTS
	**niDMM Configure Powerline Frequency**		
	`(niDMM_ConfigurePowerLineFrequency)`		
	Specifies the powerline frequency.		
	ViSession	vi	Session handle
	ViReal64	Powerline Frequency	Default = 60 Hz

Measurement Options (continued)

ICON	TYPE	PARAMETER	VALUE TO SET, COMMENTS
	**niDMM Configure Auto Zero**		
	`(niDMM_ConfigureAutoZeroMode)`		
	Configures the DMM for Auto Zero.		
	ViSession	vi	Session handle
	ViInt32	AutoZero	Default = Auto
	**niDMM Configure ADC Calibration**		
	`(niDMM_ConfigureADCCalibration)`		
	Allows the NI 4070/4071/4072 to compensate for gain drift since the last external or self-calibration.		
	ViSession	vi	Session handle
	ViInt32	ADC Calibration	Default = Auto
	**niDMM Configure Offset Comp Ohms**		
	`(niDMM_ConfigureOffsetCompOhms)`		
	Allows the NI 4070/4071/4072 to compensate for voltage offsets in resistance measurements.		
	ViSession	vi	Session handle
	ViInt32	Offset Compensated Ohms	Default = Off
	**niDMM Configure AC Bandwidth**		
	`(niDMM_ConfigureACBandwidth)`		
	Configures the Min Frequency and Max Frequency properties that the DMM uses for AC measurements.		
	ViSession	vi	Session handle
	ViReal64	Minimum Frequency	Hz
	ViReal64	Maximum Frequency	Hz
	**niDMM Configure Frequency Voltage Range**		
	`(niDMM_ConfigureFrequencyVoltageRange)`		
	Specifies the expected maximum amplitude of the input signal for frequency and period measurements on the NI 4070/4071/4072.		
	ViSession	vi	Session handle
	ViReal64	Frequency Voltage Range	Default = AutoRange
	**niDMM Configure Current Source**		
	`(niDMM_ConfigureCurrentSource)`		
	Configures the current source for diode measurements on the NI 4070/4071/4072.		
	ViSession	vi	Session handle
	ViReal64	Current Source	Default = 1.00 mA
	**niDMM Configure Waveform Coupling**		
	`(niDMM_ConfigureWaveformCoupling)`		
	Configures instrument coupling for voltage waveforms on the NI 4070/4071/4072.		
	ViSession	vi	Session handle
	ViInt32	Waveform Coupling	AC or DC

Capacitance and Inductance

ICON	TYPE	PARAMETER	VALUE TO SET, COMMENTS
	**niDMM Configure Cable Comp Type**		
	`(niDMM_ConfigureCableCompType)`		
	Sets the Cable Compensation Type property for the current capacitance/inductance mode range on the NI 4072.		
	ViSession	vi	Session handle
	ViInt32	Cable Comp Type	
	**niDMM Configure Open Cable Comp Values**		
	`(niDMM_OpenCableCompValues)`		
	Configures the Open Cable Comp Conductance and Open Cable Comp Susceptance properties on the NI 4072.		
	ViSession	vi	Session handle
	ViReal64	Conductance	
	ViReal64	Susceptance	
	**niDMM Configure Short Cable Comp Values**		
	`(niDMM_ConfigureShortCableCompValues)`		
	Configures the Short Cable Comp Resistance and Short Cable Comp Reactance properties on the NI 4072.		
	ViSession	vi	Session handle
	ViReal64	Resistance	
	ViReal64	Reactance	
	**niDMM Perform Open Cable Comp**		
	`(niDMM_PerformOpenCableComp)`		
	Performs the open cable compensation measurements and returns open cable compensation conductance and susceptance values on the NI 4072.		
	ViSession	vi	Session handle
	ViInt32	Max Time	
	ViReal64	Conductance	
	ViReal64	Susceptance	
	**niDMM Perform Short Cable Comp**		
	`(niDMM_PerformShortCableComp)`		
	Performs the short cable compensation measurements and returns short cable compensation resistance and reactance values on the NI 4072.		
	ViSession	vi	Session handle
	ViInt32	Max Time	
	ViReal64	Resistance	
	ViReal64	Reactance	

Triggers

ICON	TYPE	PARAMETER	VALUE TO SET, COMMENTS
	**niDMM Configure Trigger**		
	`(niDMM_ConfigureTrigger)`		
	Configures the DMM trigger source and trigger delay.		
	ViSession	vi	Session handle
	ViInt32	Trigger Source	Default = Immediate
	ViReal64	Trigger Delay	Default = Auto
	**niDMM Send Software Trigger**		
	`(niDMM_SendSoftwareTrigger)`		
	Sends a command to trigger the DMM.		
	ViSession	vi	Session handle
	**niDMM Configure Trigger Slope**		
	`(niDMM_ConfigureTriggerSlope)`		
	Sets the Trigger Slope property to either rising edge or falling edge polarity.		
	ViSession	vi	Session handle
	ViInt32	Trigger Slope	
	**niDMM Configure Sample Trigger Slope**		
	`(niDMM_ConfigureSampleTriggerSlope)`		
	Sets the Sample Trigger Slope property to either rising edge or falling edge polarity.		
	ViSession	vi	Session handle
	ViInt32	Slope	
	**niDMM Configure Meas Complete Dest**		
	`(niDMM_ConfigureMeasCompleteDest)`		
	Specifies the destination of the Measurement Complete (MC) signal.		
	ViSession	vi	Session handle
	ViInt32	Measurement Complete Destination	Default = None
	**niDMM Configure Meas Complete Slope**		
	`(niDMM_ConfigureMeasCompleteSlope)`		
	Sets the MC signal to either rising edge or falling edge polarity.		
	ViSession	vi	Session handle
	ViInt32	Slope	

Actual Values

ICON	TYPE	PARAMETER	VALUE TO SET, COMMENTS
	**niDMM Get Auto Range Value**		
	`(niDMM_GetAutoRangeValue)`		
	Returns the actual range that the DMM is using, even when auto ranging is off.		
	ViSession	vi	Session handle
	ViReal64*	autoRange Value	Output
	**niDMM Get Aperture Time Info**		
	`(niDMM_GetApertureTimeInfo)`		
	Returns the aperture time and aperture time units.		
	ViSession	vi	Session handle
	ViReal64*	Aperture Time	Output
	ViInt32*	Aperture Time Units	Output (seconds or PLC)
	**niDMM Get Measurement Period**		
	`(niDMM_GetMeasurementPeriod)`		
	Returns the measurement period, which is the amount of time it takes to complete one measurement with the current configuration.		
	ViSession	vi	Session handle
	ViReal64*	Measurement Period	Output (seconds)

Acquisition

ICON	TYPE	PARAMETER	VALUE TO SET, COMMENTS
	**niDMM Read**		
	`(niDMM_Read)`		
	Acquires a single measurement and returns the measured value.		
	ViSession	vi	Session handle
	ViInt32	Maximum Time	Milliseconds
	ViReal64*	Measurement	Output
	**niDMM Read Multi Point**		
	`(niDMM_ReadMultiPoint)`		
	Acquires multiple measurements and returns an array of measured values.		
	ViSession	vi	Session handle
	ViInt32	Maximum Time	Milliseconds
	ViInt32	Number to Read	Default = 4
	ViReal64 [ ]	Measurements	Output
	ViInt32*	Actual Number	Output

Acquisition (continued)

ICON	TYPE	PARAMETER	VALUE TO SET, COMMENTS

niDMM Read Waveform

(niDMM_ReadWaveform)

Acquires a waveform and returns an array representing the digitized waveform on the NI 4070/4071/4072.

ViSession	vi	Session handle
ViInt32	Maximum Time	Milliseconds
ViInt32	Number to Read	Default = 1
ViReal64[]*	Waveform Data	Output
ViInt32*	Actual Number	Output

niDMM Is Over Range

(niDMM_IsOverRange)

Takes a measurement value and determines if the value is a valid measurement or a value indicating that an overrange condition occurred.

ViSession	vi	Session handle
ViReal64	Measurement	Input
ViBoolean*	Over range?	Output

Low-Level Acquisition

ICON	TYPE	PARAMETER	VALUE TO SET, COMMENTS

niDMM Initiate

(niDMM_Initiate)

Initiates an acquisition.

ViSession	vi	Session handle

niDMM Fetch

(niDMM_Fetch)

Returns the value from a previously initiated measurement. You must call `niDMM Initiate` before calling this VI.

ViSession	vi	Session handle
ViInt32	Maximum Time	Milliseconds
ViReal64*	Measurement	Output

niDMM Fetch Multi Point

(niDMM_FetchMultiPoint)

Returns an array of values from a previously initiated multipoint measurement.

ViSession	vi	Session handle
ViInt32	Maximum Time	Milliseconds
ViInt32	Number to Fetch	Default = 4
ViReal64[ ]	Measurements	Output
ViInt32*	Actual Number	Output

Low-Level Acquisition (continued)

ICON	TYPE	PARAMETER	VALUE TO SET, COMMENTS
	**niDMM Fetch Waveform**		
	(niDMM_FetchWaveform)		
	Acquires an array of data from a waveform on the NI 4070/4071/4072.		
	ViSession	vi	Session handle
	ViInt32	Maximum Time	Milliseconds
	ViInt32	Number to Fetch	Default = 1
	ViReal64[ ]*	Waveform Data	Output
	ViInt32*	Actual Number	Output
	**niDMM Read Status**		
	(niDMM_ReadStatus)		
	Returns measurement backlog and acquisition status on the NI 4060 and NI 4070/4071/4072.		
	ViSession	vi	Session handle
	ViInt32*	Backlog	Output
	ViInt16*	Acquisition State	Output
	**niDMM Abort**		
	(niDMM_Abort)		
	Aborts a previously initiated measurement and returns the DMM to the Idle state.		
	ViSession	vi	Session handle

Utility

ICON	TYPE	PARAMETER	VALUE TO SET, COMMENTS
	**niDMM Reset**		
	(niDMM_reset)		
	Resets the instrument to a known state and sends initialization commands to the instrument.		
	ViSession	vi	Session handle
	**niDMM Self Test**		
	(niDMM_self_test)		
	Performs a self-test on the DMM to ensure that the DMM is functioning properly.		
	ViSession	vi	Session handle
	ViInt16*	Self Test Result	Output
	ViChar [ ]	Self Test Message	Output
	**niDMM Revision Query**		
	(niDMM_revision_query)		
	Returns the revision numbers of the instrument driver and instrument firmware.		
	ViSession	vi	Session handle
	ViChar [ ]	Instrument Driver Revision	Output
	ViChar [ ]	Firmware Revision	Output

Utility (continued)

ICON	TYPE	PARAMETER	VALUE TO SET, COMMENTS
	**niDMM Format Measurements Absolute**		
	(niDMM_FormatMeasAbsolute)		
	Formats the measurement to the proper number of displayed digits.		
	ViInt32	Function	DC volts, AC volts, and so on
	ViReal64	Range	Input
	ViReal64	Resolution	Input
	ViReal64	Measurement	Input
	ViChar [ ]	Mode String	Output
	ViChar [ ]	Range String	Output
	ViChar [ ]	Data String	Output
	**niDMM Get Digits Of Precision**		
	(niDMM_GetDigitsOfPrecision)		
	Returns the digits of precision calculated from the range and resolution information specified in niDMM Configure Measurement.		
	ViSession	vi	Session handle
	ViReal64*	Digits	Output (3.5/4.5/5.5/6.5)
	**niDMM Error Message**		
	(niDMM_error_message)		
	Takes the error cluster returned by the VIs, interprets it, and returns it as a user-readable string.		
	ViSession	vi	Session handle
	ViBoolean	Message Box (Only applies to LV)	Default = Do not show dialog
	ViStatus*	Error Code	Input/Output
	ViChar [ ]	Error Message	Output

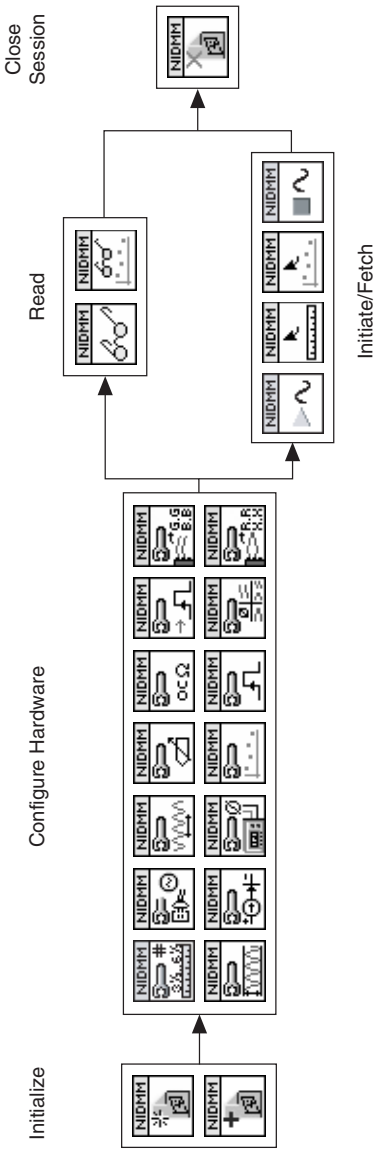
Calibration

ICON	TYPE	PARAMETER	VALUE TO SET, COMMENTS
	**niDMM Self Cal**		
	(niDMM_SelfCal)		
	Executes the self-calibration routine to maintain measurement accuracy on the NI 4070/4071/4072.		
	ViSession	vi	Session handle
	**niDMM Get Cal Count**		
	(niDMM_GetCalCount)		
	Returns the calibration count for the specified type of calibration.		
	ViSession	vi	Session handle
	ViInt32	Area	Default = Internal
	ViInt32*	Count	Output

Calibration (continued)

ICON	TYPE	PARAMETER	VALUE TO SET, COMMENTS
	**niDMM Get Dev Temp**		
	`(niDMM_GetDevTemp)`		
	Returns the current temperature of the NI 4070/4071/4072.		
	ViSession	vi	Session handle
	ViString	Reserved	" "
	ViReal64*	Temperature	Output
	**niDMM Get Last Cal Temp**		
	`(niDMM_GetLastCalTemp)`		
	Returns the temperature during the last calibration procedure on the NI 4070/4071/4072.		
	ViSession	vi	Session handle
	ViInt32	Area	Default = Internal
	ViReal64*	Temperature	Output
	**niDMM Get Cal Date and Time**		
	`(niDMM_GetCalDateAndTime)`		
	Returns the date and time of the last calibration performed on the NI 4070/4071/4072.		
	ViSession	vi	Session handle
	ViInt32	Area	Default = Internal
	ViInt32*	Month	Output
	ViInt32*	Day	Output
	ViInt32*	Year	Output
	ViInt32*	Hour	Output
	ViInt32*	Minute	Output

DMM Programming Flow



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